

1. A method of substantially reducing the number of tilt or divot defects that are present in a silicon-on-insulator (SOI) substrate, said method comprising the steps of:

(a) implanting oxygen ions into a surface of a Si-containing substrate, said implanted oxygen ions having a concentration sufficient to form a buried oxide region during a subsequent annealing step; and

(b) annealing said substrate containing said implanted oxygen ions in an ambient gas that comprises from about 0 to about 90% oxygen and from about 10 to about 100% of N₂ to form said buried oxide region which electrically isolates a superficial Si-containing layer from a bottom Si-containing layer.

25. (Amended) The method of Claim 1 wherein said ambient gas comprises 100%

N₂.

26. (Amended) The method of Claim 1 wherein said ambient gas is admixed with Ar.

27. (Amended) The method of Claim 1 wherein said annealing step is carried out at a temperature of from about 1250°C or greater for a time period of from about 1 to about 100 hours.

29. (Amended) The method of Claim 1 wherein said annealing step includes a ramp and soak-heating regime.

30. (Amended) The method of Claim 1 wherein said annealing step comprises the steps of: partially annealing the Si-containing substrate containing the implanted oxygen ions in oxygen so as to form a surface layer of oxygen on the Si-containing and to partially form said BOX region; stripping the surface layer of oxygen; and continuing the annealing in said oxygen and N₂ gas ambient to complete formation of said BOX region.